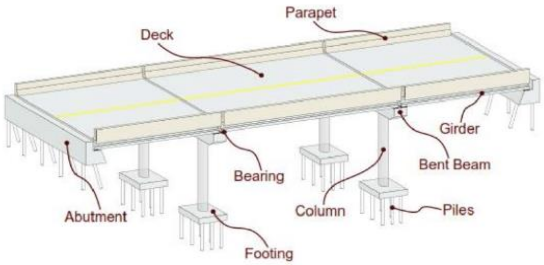
North Carolina Department of Transportation
Transportation Program Management Unit - Value Management
Innovative Technologies and Products Awareness Report
April 3, 2019

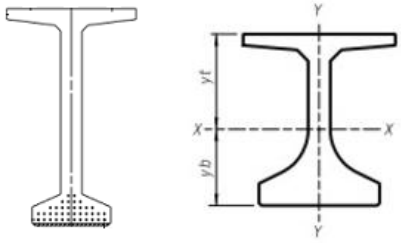
PRODUCT HIGHLIGHT – F.I.B.

Girders are used in bridges as the main horizontal supports for the deck. There are many types of girders used for varying bridge scenarios that are dependent on bridge geometry, bridge length, and bridge height. A girder that has recently become more common and used in North Carolina is the Florida I-Beam (F.I.B.), which was first developed and used by Florida DOT in 2009.

Bonner Bridge Project 8/29/2018
Photo: Coastal Times

Example of a bridge diagram found on Google Images to identify the location of the girders on a typical bridge section.





Cross-section drawings of a typical girder (left) and F.I.B. (right).

The Florida I-Beam (F.I.B.) girders can be designed to span further than typical girders of similar size due to the cross section. The cross section of the girders (see image to the left) contains a wider and rounded bottom flange than typical girders. This design provides support more efficiently and allows for additional reinforcement in the web – the middle of the cross section. The girders can possibly reduce the number of bent substructures required and, depending on the geometry, could eliminate a girder line due to the efficiency of the cross section. The efficiency can result in cost savings for the Department. These beams were used on the Bonner Bridge project and Topsail Island bridge project and were found to be very successful. The Structures Management Unit is developing standards for these to increase their use on NCDOT projects.

PRODUCT INNOVATION – Scissor Bridge

NC 147 Bridge

A scissor bridge places the bridge girders perpendicular to traffic. Typical layouts have girders running parallel with the traffic flow. It is used in intersection locations where the skew of the bridge is connecting alignments that create a tight skew on the bridge. In these situations, additional land would be needed to reconfigure the two roads, or a scissor bridge could be used. The scissor bridge uses only a small portion of the deck (as seen in the images) for the travel lanes.

NC 147 Bridge in Durham County
Photo: RS&H

This method was successful on the I-295 and All American Freeway interchange in Fayetteville, NC. Based on that success and similar conditions, the same method was applied to the connector of US 70 and NC 147 in Durham as shown in the images.